

What is claimed is:

1 1. A load port transfer device, for delivering a
2 wafer carrier along an overhead conveying system,
3 including:

4 a load port;

5 a path, having vertical and horizontal components,
6 the vertical component having a top portion
7 connected to the horizontal component beside
8 the overhead conveying system and a bottom
9 portion extending from the load port; and

10 a robot, movably disposed on the path to transfer
11 the wafer carrier between the load port and the
12 overhead conveying system.

1 2. The load port transfer device as claimed in
2 claim 1, wherein the path is L-shaped.

1 3. The load port transfer device as claimed in
2 claim 1, wherein the horizontal component is located
3 above the overhead conveying system.

1 4. The load port transfer device as claimed in
2 claim 1, wherein the robot further includes a moving
3 mechanism, disposed within the path and a holding
4 mechanism, disposed on the moving mechanism to maintain
5 the wafer carrier in a horizontal position.

1 5. The load port transfer device as claimed in
2 claim 4, wherein the holding mechanism having first and
3 second ends, wherein the first end is removably connected

4 to the wafer carrier and the second end is movably
5 connected to the moving mechanism.

1 6. The load port transfer device as claimed in
2 claim 5, wherein the first end is gripper-shaped to grasp
3 the wafer carrier.

1 7. The load port transfer device as claimed in
2 claim 4, wherein the moving mechanism is a roller.

1 8. The load port transfer device as claimed in
2 claim 4, wherein the moving mechanism is a gear wheel.

1 9. The load port transfer device as claimed in
2 claim 4, wherein the moving mechanism is a chain.

1 10. The load port transfer device as claimed in
2 claim 4, wherein the moving mechanism is a timing belt.

1 11. The load port transfer device as claimed in
2 claim 4, wherein the moving mechanism is a curtain slat.

1 12. The load port transfer device as claimed in
2 claim 4, wherein the moving mechanism is a wire.

1 13. A load port transfer device, for delivering a
2 wafer carrier to a conveying system, comprising:

3 a load port;

4 a path, having vertical and horizontal components,

5 the vertical component having a top portion

6 beside the conveying system and a bottom

7 portion, extending from the load port; and

8 a robot, including a moving mechanism movably

9 disposed on the path to transfer the wafer

10 carrier between the load port and the conveying
11 system, and a holding mechanism having a first
12 end holding the wafer carrier and a second end
13 disposed on the moving mechanism.

1 14. The load port transfer device as claimed in
2 claim 13, wherein the horizontal and the vertical
3 components form an L-shape.

1 15. The load port transfer device as claimed in
2 claim 13, wherein the first end is gripper-shaped to
3 grasp the wafer carrier.

1 16. The load port transfer device as claimed in
2 claim 13, wherein the moving mechanism is a roller.

1 17. The load port transfer device as claimed in
2 claim 13, wherein the moving mechanism is a gear wheel.

1 18. The load port transfer device as claimed in
2 claim 13, wherein the moving mechanism is a chain.

1 19. The load port transfer device as claimed in
2 claim 13, wherein the moving mechanism is a timing belt.

1 20. The load port transfer device as claimed in
2 claim 13, wherein the moving mechanism is a curtain slat.

1 21. The load port transfer device as claimed in
2 claim 13, wherein the moving mechanism is a wire.

1 22. An intra-bay delivery system comprising:
2 a wafer carrier;
3 a load port supporting the wafer carrier;
4 a conveyor, disposed above the load port;
5 a rail having vertical and horizontal components,
6 wherein the vertical component extends from the
7 load port and the horizontal component is
8 located above the conveyor; and
9 a robot including a roller movably disposed on the
10 rail to transfer the wafer carrier between the
11 load port and the conveyor and a holding
12 portion having a first end holding the wafer
13 carrier and a second end disposed on the
14 roller, wherein the first end holding the wafer
15 carrier is a flange.